COMP 3825 – Network and Information Assurance

Instructor:
Brodrick Stigall (brodrick.stigall@memphis.edu)

TA:
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Lectures:
Monday/Wednesday, 2:20 pm - 3:45 pm, Dunn Hall 123

Office Hours:
Instructor Office Hours: By appointment (send email to set up)
TA Office Hours: By appointment

Course Website:
https://memphis.instructure.com/

Course Description:
This course will introduce the principles of computer networks, including: Layers of Networking, Applications (World-Wide Web, Email, DNS), and Network Management, etc. It will also introduce the basic concepts of information assurance, including Threat Model, Basic Cryptography (Symmetric Cryptography, Public-key Cryptography, Message Authentication), Security Policies and Cyber-ethics. (The content and syllabus are subject to adjustment during the semester.)

Prerequisites: COMP 2700, COMP 2150

Required Text
- Computer Networking: A Top-Down Approach, 7th Edition, James F. Kurose and Keith W. Ross, Pearson, 2017 (ISBN: 0133594149)
  - Free version is available online.

Evaluation:
Grading: Your final grade will come from the following sources:

- 10% Class participation/In-class Quiz
- 20% Homework
- 20% Term Project
- 20% Mid-term Exam
- 30% Final Exam

This scheme is subject to change at the instructor's discretion.

Grading Scale:

A+: 94, A: 90, A-: 87, B+: 84, B: 81, B-: 79, C+: 75, C: 72, C-: 68, D+: 64, D: 60, F: < 60.

Course Policies:

- **Late Policy:** Without prior request, no late work will be accepted. All late submission maybe accepted at a penalty of 10% per day for no more than THREE days.
- **Attendance Policy:** Students are expected to attend class regularly and study the materials covered in the class. Attendance may be taken randomly from time to time which will affect the points for class participation.
- **Testing Policy:** The exam given is closed book/note/laptop/neighbor. But students are allowed to bring one cheat sheet (letter-sized 8.5-by-11) for quick reference. There will NOT be any makeup exams unless there is a documented emergency.
- **Homework Assignment and Project Report Policy:** It is recommended that students use a word processing software (e.g., Word or LaTeX) to type their homework solutions or project report, then submit well-formatted PDF files.

Plagiarism/Cheating Policy:

Plagiarism or cheating behavior in any form is unethical and detrimental to proper education and will not be tolerated. All work submitted by a student (projects, programming assignments, lab assignments, quizzes, tests, etc.) is expected to be a student's own work. The plagiarism is incurred when any part of anybody else's work is passed as your own (no proper credit is listed to the sources in your own work) so the reader is led to believe it is therefore your own effort. Students are allowed and encouraged to discuss with each other and look up resources in the literature (including the internet) on their assignments, but appropriate references must be included for the materials consulted, and appropriate citations made when the material is taken verbatim.

If plagiarism or cheating occurs, the student will receive a failing grade on the assignment and (at the instructor's discretion) a failing grade in the course. The course instructor may also decide to forward the incident to the University Judicial Affairs Office for further disciplinary action. For further information on U of M code of student conduct and academic discipline procedures, please refer to: http://www.people.memphis.edu/~jaffairs/

Your written work may be submitted to Turnitin.com, or a similar electronic detection method, for an evaluation of the originality of your ideas and proper use and attribution of sources. As part of this process, you may be required to submit electronic as well as hard copies of your written work, or be given other instructions to follow. By taking this course, you agree that all assignments may undergo this review process and that the assignment may be included as a source document in Turnitin.com's restricted access database solely for the purpose of detecting plagiarism in such documents. Any assignment not submitted according to the procedures given by the instructor may be penalized or may not be accepted at all.

Topics:

Introduction
- o Course Overview and Introduction

Concepts of Computer Networks
- Network Overview
  - o Network Core
  - o Protocol Layering
- Network Applications
  - o Web
  - o Email
  - o DNS
  - o Socket Programming
- Transport Layer
  - o TCP
  - o UDP
- Network Layer
  - o IP
  - o NAT and ICMP
  - o Routing

Concepts of Information Assurance
- Symmetric Cryptography
  - o One Time Pad
  - o Stream Cipher
  - o Block Cipher (DES, AES)
- Public Key Cryptography
  - o Basic Key Exchange
  - o Hard problems and RSA
- Message Authentication and Digital Signatures
- TLS/SSL
- CyberEthics